

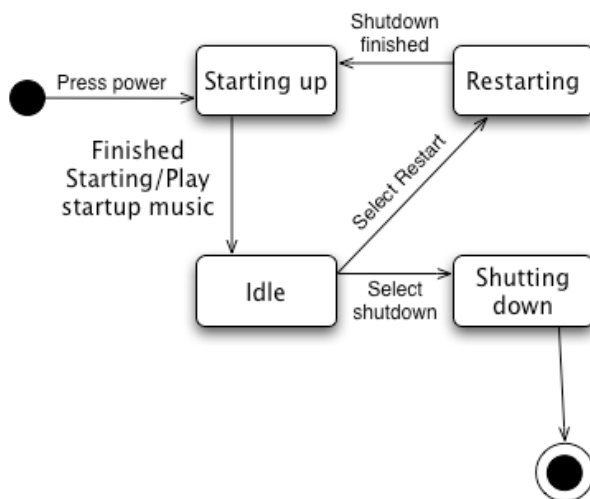
Software Engineering Fundamentals - Tutorial

Behaviour - Statecharts

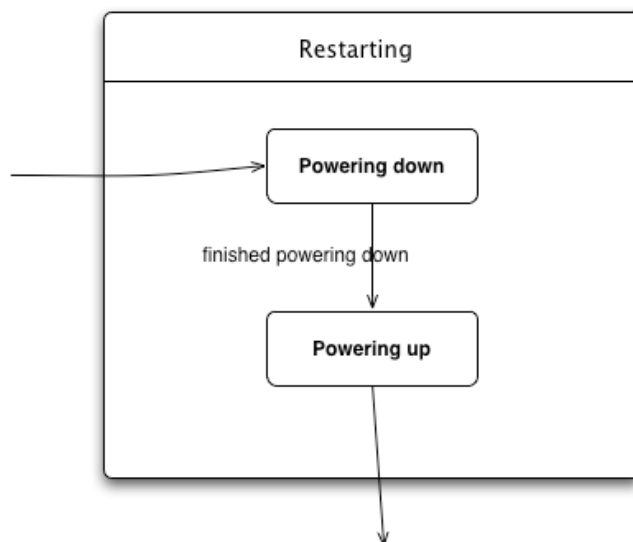
Q1

Draw a state diagram showing the transitions between the states a computer can be in. You should model Starting up, Shutting Down, Restarting, Idle.

Where would you put the action "Play startup music" on the state diagram?

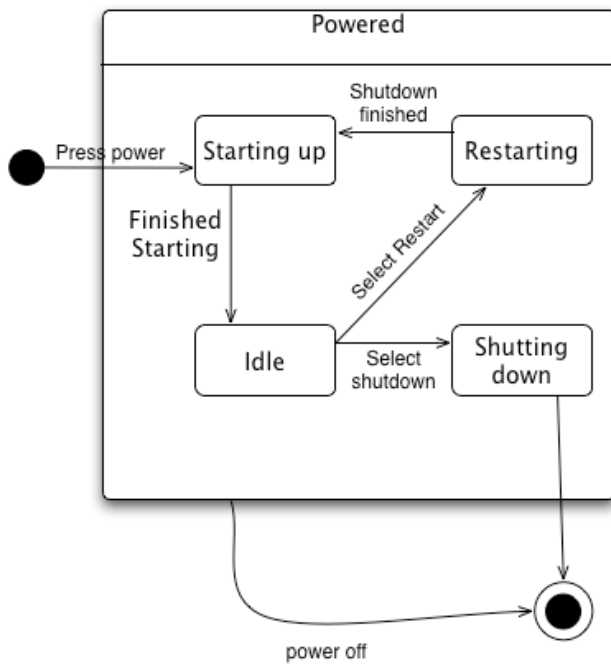


down is different from restarting - it doesn't start up again without manual intervention!
Clearly the computer needs to "remember" that after it has turned off it needs to start again, thus the need for a restart state.
You could draw restart state as two separate internal states...



How to handle a loss of power?

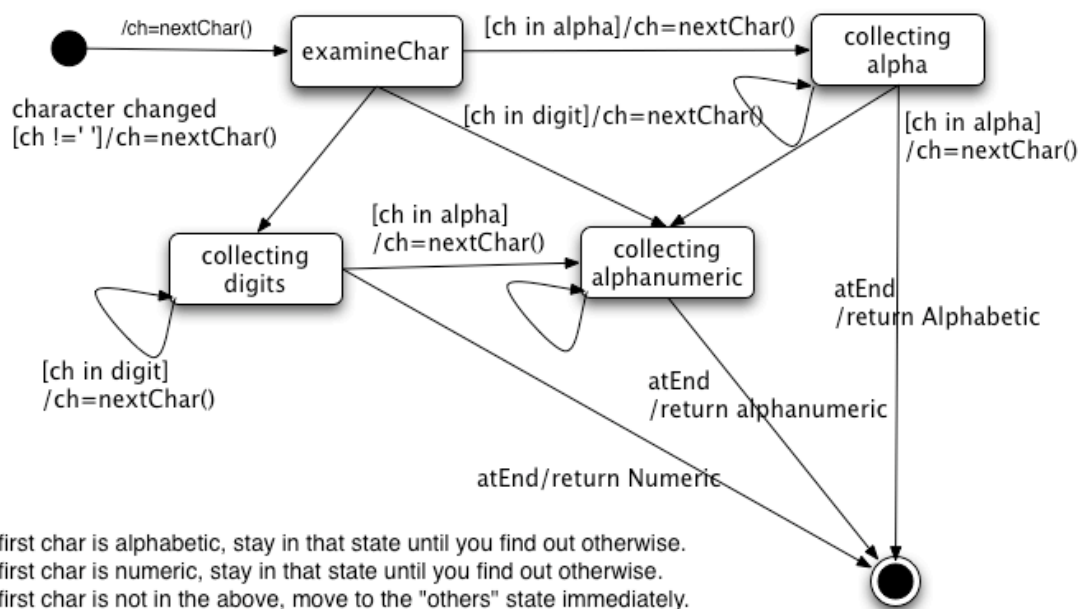
You could use a single composite state that allows a transition to the off state with the event power off.



Q2

Draw a state diagram to determine whether a sequence of characters in a string is either a word (starts with only alphabetic character), a number (starts with and contains only digits) or neither (contain both alphabetic and numeric characters).

You can assume that one or more spaces separates each sequence of characters.



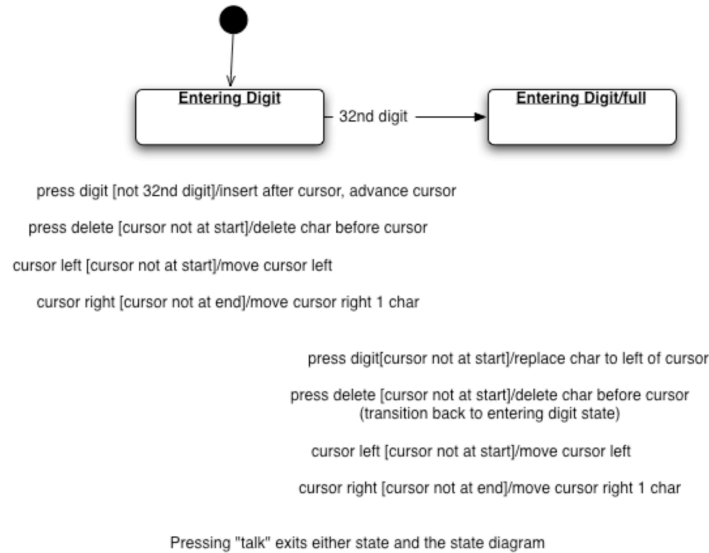
Q3

A phone with a display allows you to edit phone numbers that you have entered. The phone contains controls for moving the cursor left and right, a delete (which deletes the digit to the left of the cursor), a "talk" button and the digits 0-9. You can enter phone numbers up to 32 digits long. When the phone

is currently storing 32 digits any further digits entered replace the digit to the left of the cursor.

Draw a state diagram for the system involved in entering/editing a phone number. Note any guards/actions you would have on the transitions.

Most of the work on this is in the conditions associated with the arcs.



Is this a good state diagram? Maybe. Could it be done with more states? Yes.

How do you determine if it is of any use? You examine the utility of the diagram. Does it help explain the system? Will it make development of the system easier?